Solar System Lab block D

Solar System Lab

You are an alien from another system. The Solar System has recently been discovered and your mission is to find out, and report to your captain (me), about it.

The GRB Lottery

On your way to the Solar System, you detected a lot of gamma rays bursts (GRB) coming your way that kept fading away before you could get a good look at them. After some research you've learned that they happen when a star goes supernova and forms a black hole. Your interest was tweaked by the randomness of the bursts' locations and you "happened" to run across a Lottery program on Earth's computer system designed for you to make guesses as to where the next burst will occur. (The closest guesser wins a certificate and NASA educational materials!)

1. Go to http://swift.sonoma.edu/grb_lotto
2. Read up on Gamma-Ray Bursts to find out how often they could be seen from here on Earth.
3. Make a guess and then forward the confirmation email to me at tdella@sd43.bc.ca with a **subject line** that says "Guess of … , *your name and block*." Also, please include your reasoning for choosing that location in the body of the email.

The Solar System Mission

rotation – spin on axis
revolution – orbit around something

The Planets

Inner planets (Terrestrial, Earthlike)

Mercury

1. Is there an atmosphere? not really, solar wind blew it away, not much "g"
2. What caused all the craters on this rocky planet? bombardment by space rocks
3. Lots of craters means that a surface is old, why? all planets were hit, but ⊕ has renewed its surface
4. What causes the two extremes in temperature (very hot and very cold)? – Two reasons. very slow rotation; minimal atmosphere to trap heat

Venus **WARNING: Temperatures are too hot. You will be destroyed if you land.**

1. What direction does Venus rotate (on its axis)? clockwise
2. What is the composition of the atmosphere? CO_2 + SO_4 acid
3. What is the surface temperature and why is it so high? 465°C, runaway greenhouse effect
4. Why does this rocky planet not have many craters? thick atm, burns meteors up; any craters are erased by tectonics
5. Why do Mercury and Venus have no moons? Sun's gravity too strong.

Earth

1. Give a brief description of the surface features. 75% water, erosion, tectonics
2. Which planet does Earth's Moon most resemble? Mercury

Mars

1. The atmosphere is very thin yet there are huge dust storms, why? there is lots of dust
2. Why does the planet appear red (has to do with the dust)? rusty dust (iron oxide)
3. What are the ice caps made of? CO_2 + H_2O
4. How large is Olympus Mons? What is it? 25km tall, 600km wide, sheild volcano.
5. How many moons orbit Mars? Where are they believed to have come from? 2, captured asteroids

Outer planets (Gas giants) Jovian)

Jupiter

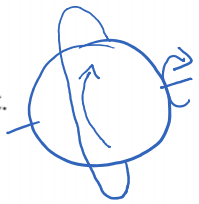
1. What is that huge red spot? hurricane, 2-3 Earths, 300 yrs old
2. Apparently one of the moons is larger than Mercury – please confirm which one. Ganymede
3. What is the current count of the number of moons orbiting this planet? 67+

Saturn

1. How do the beautiful rings, made of rock and ice, form? moons too close, gravity rips apart
2. Which three planets, other than Saturn, have rings? Jupiter, Uranus, Neptune
3. What is the current count of the number of moons orbiting this planet? 62+

Uranus

1. Uranus' axis is tilted at an odd angle making it rotate backwards. Please draw it.



2. What is the current count of the number of moons orbiting this planet? 27

Neptune

1. What is the Dark Spot believed to be? hurricane
2. What is the current count of the number of ~~moons~~ satellites orbiting this planet? 13 + 1?

Other Objects

Asteroid Belt

1. Briefly describe what these objects look like. rocky, irregular
2. How many of them are there? countless, billions, keep breaking
3. Where are they located in the Solar System between mars & Jupiter
4. How big is the biggest? What is its name? Ceres 1000km

Kuiper Belt

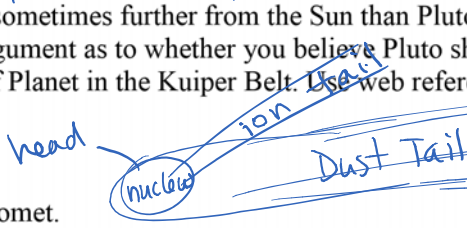
1. Where is this belt of objects located? beyond Neptune
2. How many of them are there? 200x the asteroid belt (trillions)
3. How big is the biggest? What is its name? Eris – outside Kuiper Belt? so then Pluto is largest

Dwarf Planets

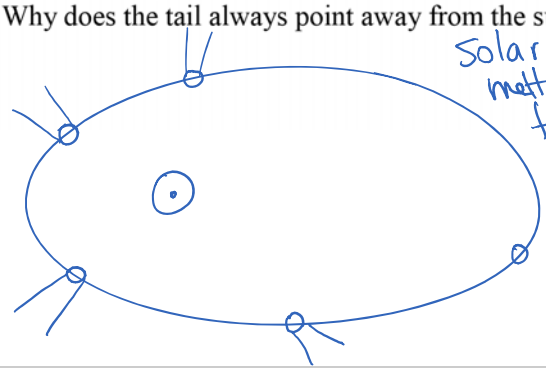
1. Pluto is now classified as a Dwarf Planet. List the other Dwarf Planets in the Solar System. Eris, Ceres, Makemake, Haumea ....
2. Sketch why Neptune is sometimes further from the Sun than Pluto.
3. Produce a reasonable argument as to whether you believe Pluto should be classified as a regular Planet or a Dwarf Planet in the Kuiper Belt. Use web references to back up your ideas.

Comets

1. Describe the parts of a comet.



2. Why does the tail always point away from the sun?



Solar radiation melts + creates tail, but also pushes it away.